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LISTS OF SPECIES

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First survey of darkling beetles (Coleoptera, Tenebrionidae) of Talassemtane National Park, Western Rif, Morocco

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Abstract: To contribute to the knowledge of beetles (Coleoptera) of the mountainous region of Morocco, Talassemtane National Park (Western Rif, Chefchaouen district, Morocco) was surveyed. This is an exceptional protected area of the Mediterranean Intercontinental Biosphere Reserve (RIBM). The inventory was made using different traps combined with active searching periodically during 2013 and 2014. Among numerous species belonging to various families, the darkling beetles (Tenebrionidae) represent one of the major groups, in terms of diversity and heritage value. Thirty five species were identified, two species are new records to Morocco, and two other species, which were hitherto only known by the type specimens, have been rediscovered

Key words: Morocco, Rif, Talassemtane National Park, Coleoptera, Tenebrionidae

INTRODUCTION

Created in October, 2004, Talassemtane National Park (PNTLS) is located in the western portion of the calcareous ridge of the Rif's mountain range. The park constitutes a unique territory containing natural landscapes that are nationally of significant heritage value. Its position at the crossroads of Europe and Africa, its climatic characteristics, its geological characteristics, and its paleogeographic antecedents, have given rise of a unique fauna and flora. As such, the national park is includes it at the Mediterranean Intercontinental Biosphere Reserve (RBIM), intended for the conservation of the most emblematic natural areas of northern Morocco and southern Spain.

Talassemtane National Park harbors more than 750 plant species (56 are endemic) belonging to 103 families (Meda 2008). It also lodges about 40 species of mammals, more than 100 species of birds; reptiles and amphibians are represented by about 30 species with an endemism rate reaching 27% (Meda 2008). Aquatic macro-invertebrates count 180 species of which 48 are endemic. Obviously, the invertebrates of PNTLS remain less studied than plants and vertebrates, with only a few of studies to date on Diptera, Simuliidae (Belqat et al. 2001), ants (Taheri et al. 2014), and water beetles (Benamar et al. 2011). To address the lack of information on invertebrates of Moroccan protected areas and to enrich the list of the Rifian entomofauna and especially that of PNTLS, a study of the Coleoptera was carried out. This study was within the framework of an Agronomic Research Program for Development (PRAD). In addition to inventory, the objective of this study is to detect species related to the forest stands in order to establish a management policy that aims to improve their conservation.

In this paper, we treat only the family of Tenebrionidae. This is one of the largest Beetle families in the world, with about 19,000 known species in more than 2,000 genera (Aalbu et al. 2002). Their large biodiversity is in particular due to the lack of wings of most of their representatives (Soldati 2007). Tenebrionidae are found in all latitudes, from coastal zones to over 5,000 meters (a. s. l.) in South American mountains but they especially abound in all warm regions of the world with important endemism in arid areas (Soldati 2007). This choice is justified by the fact that this group is rather well-known in Morocco (Kocher 1956, 1958, 1964, 1969; Español

1959), that one in seven beetle species belongs to this family in Morocco (Kocher 1958), and that this family has the highest endemism rate in Morocco (Chavanon 2003). Today, nearly 700 species of Tenebrionidae are known in Morocco (Löbl and Smetana 2008). Thus, in relation to its area, Morocco is one of the most biodiverse areas in the world for darkling beetles (Tenebrionidae, Coleoptera) and the greatest rate of endemism in the entire Mediterranean basin. Only Spain, in Europe, can show a comparable diversity and a higher endemism rate reaching 60% (Soldati 2007).

MATERIALS AND METHODS

Study site

PNTLS covers an area of 64,601 ha. Two-thirds of the park is within the province of Chefchaouen and one-third belongs to the province of Tetouan (Figure 1). It is mainly formed by the southern portion of the Rifian calcareous ridge and includes the highest summits of western Rif. The climate of PNTLS is characterized by being the wettest zone of North Africa. The park is characterized by two climax forest stands, formed by an endemic and relict fir species, *Abies maroccana Trab.* The Talassemtane fir forest is the largest and extends over 2,300 ha. Our survey was carried out in pure fir forests (in the highest zones), as well as in fir-oak (*Quercus ilex*) forests.

Data collection

The records of trap contents were performed once every 15 days, for 7 months (April–October), during 2013 and 2014. Window flight traps, and in particular the multidirectional Polytrap™, were used because are probably best suited for inventorying saproxylophagous beetles in temperate forest. These traps output and their selective power, in term of capture of Coleoptera, compared to the other arthropods, are rather eloquent (Bouget and Brustel 2009). The multidirectional window flight traps were primed with ethanol, which serves as

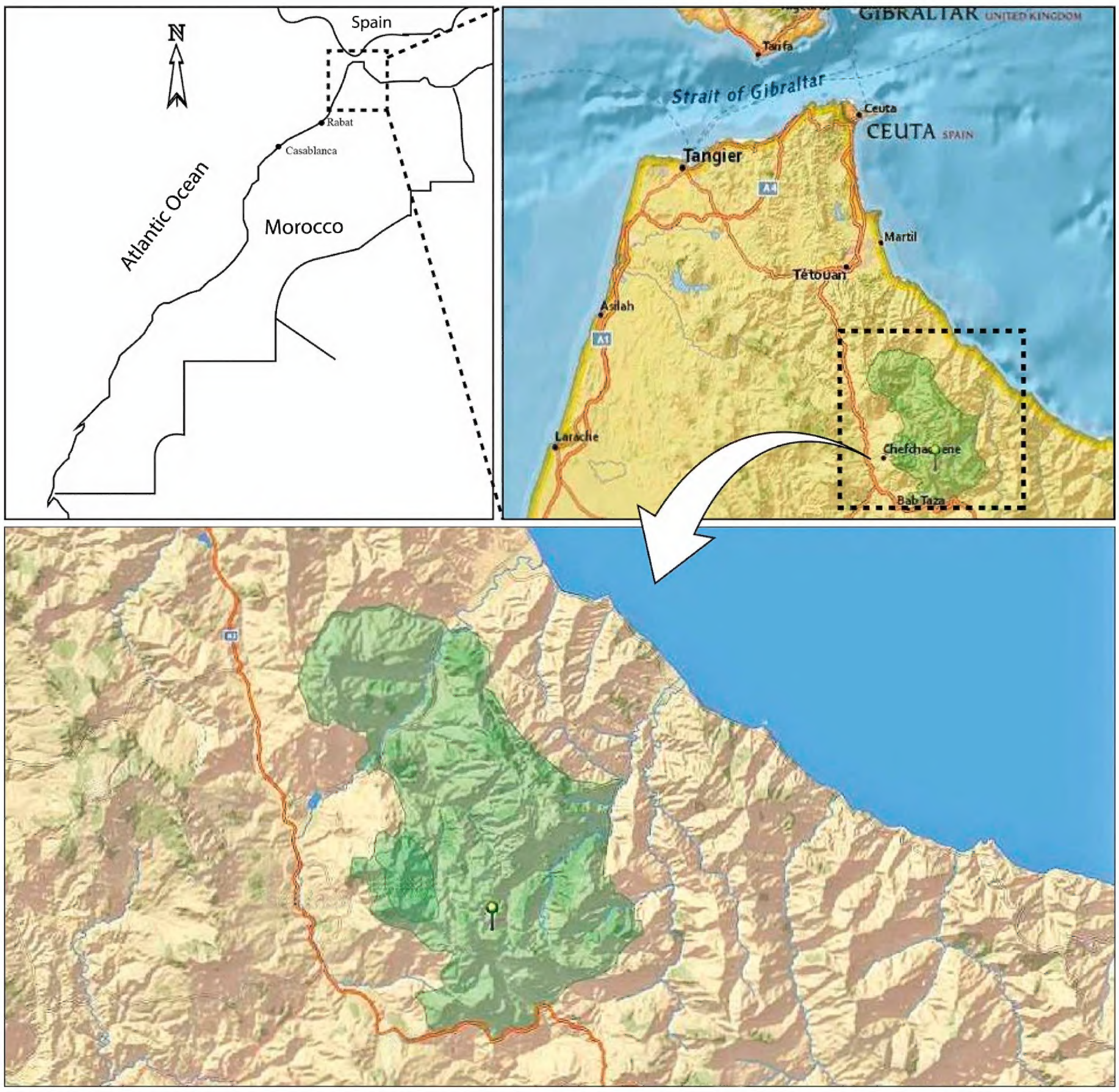

Figure1. Map of Morocco, showing the location of Talassemtane National Park. The green cropped area indicates limits of the Park.

an attractant for numerous saproxylophagous beetles (Bouget and Brustel 2009).

Two other type of traps were used in the inventory, pitfall traps installed at ground level, to intercept ground fauna, and yellow colored traps used in open environments, to attract the flower-dwelling species. All traps were installed in 20 unsystematic plots in the fir grove.

Active searching were made during April 2013, August 2013, October 2013, June 2014 and September 2014, most often during the installation of the protocol or the statements of traps. Many active methods were then used such as barking dead trees, raising stones, beating or sifting.

Identification

Most of specimens were identified in comparison with the large collection of Fabien Soldati, one of the Western Palaearctic tenebrionid specialists. Other specimens were identified with the help of the following works, keys or original descriptions: Antoine (1948, 1949a, 1949b, 1951), Español (1953), Pérez Vera and Avila (2012), and Pardo-Alcaide (1978).

Voucher specimens were deposited in the institutional collections of the Centre de Recherche Forestière (Rabat, Morocco), École d'Ingénieurs de Purpan (Toulouse, France), and in private collections of Fabien Soldati (Limoux, France) and Olivier Courtin (Castres, France).

RESULTS

A total of 316 darkling beetles belonging to 35 species from eight subfamilies (Alleculinae, Diaperinae, Lagriinae, Opatrinae, Phrenapatinae, Pimeliinae, Stenochiinae, and Tenebrioninae) were collected. Two species are new records to Morocco: *Clamoris crenatus* (Mulsant, 1854) and *Pentaphyllus chrysomeloides* (Rossi, 1792). Two other species, which were hitherto only known by the type specimens, have been rediscovered: *Asida (Planasida) septemsis* Pérez Vera, Ruiz & Avila, 2012 and *Hymenophorus candeli* (Pardo-Alcaide, 1978). In addition, amongst the species listed, 15 are endemic to Morocco.

List of species

(* taxa considered saproxylophagous; [E] strictly endemic to Morocco)

Subfamily Alleculinae

Gastrhaema rufiventris (Waltl, 1835)

Examined material: Talassemtane, fir grove, 15.VIII.2014, Polytrap traps, 2 specimens, Yousra Benyahia *leg.*

Distribution: Betico-Riffian species, presents in the extreme south of Spain, in Morocco and in North East of Algeria. In Morocco, the species is cited from Tangier to the Middle and High Atlas (Kocher 1956).

Heliotaurus maroccanus (Lucas, 1846)

Examined material: Talassemtane, fir grove, 20.VI.2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg. Idem*, 04.VII.2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg. Idem*, 20.VI.2014, 2 specimens found died under stones, Fabien Soldati *leg. Idem*, 30.VI.2014, Polytrap traps, 3 specimens, Yousra Benyahia *leg.*

Distribution: Morocco and Algeria (Novak and Pettersson, 2008); Middle and High Atlas (Kocher 1956); first mention for Rif mountain range.

Hymenalia crassicollis (Fairmaire, 1866)

Examined material: Talassemtane, fir grove, 19.VII.2013, Polytrap traps, 7 specimens, Yousra Benyahia *leg. Idem*, 15.VIII.2013, Polytrap traps, 2 specimens Yousra Benyahia *leg. Idem*, 30.VII.2014, Polytrap traps, 1 specimen, Yousra Benyahia *leg. Idem*, 04.VI.2014, colored traps, 1 specimen, Yousra Benyahia *leg. Idem*, 04.VIII.2014, colored traps, 2 specimens, Yousra Benyahia *leg.*

Distribution: Morocco and Algeria (Novak and Pettersson 2008); in Morocco, cited from pre-Rif, Middle-Atlas and lower Moulouya (Kocher 1956).

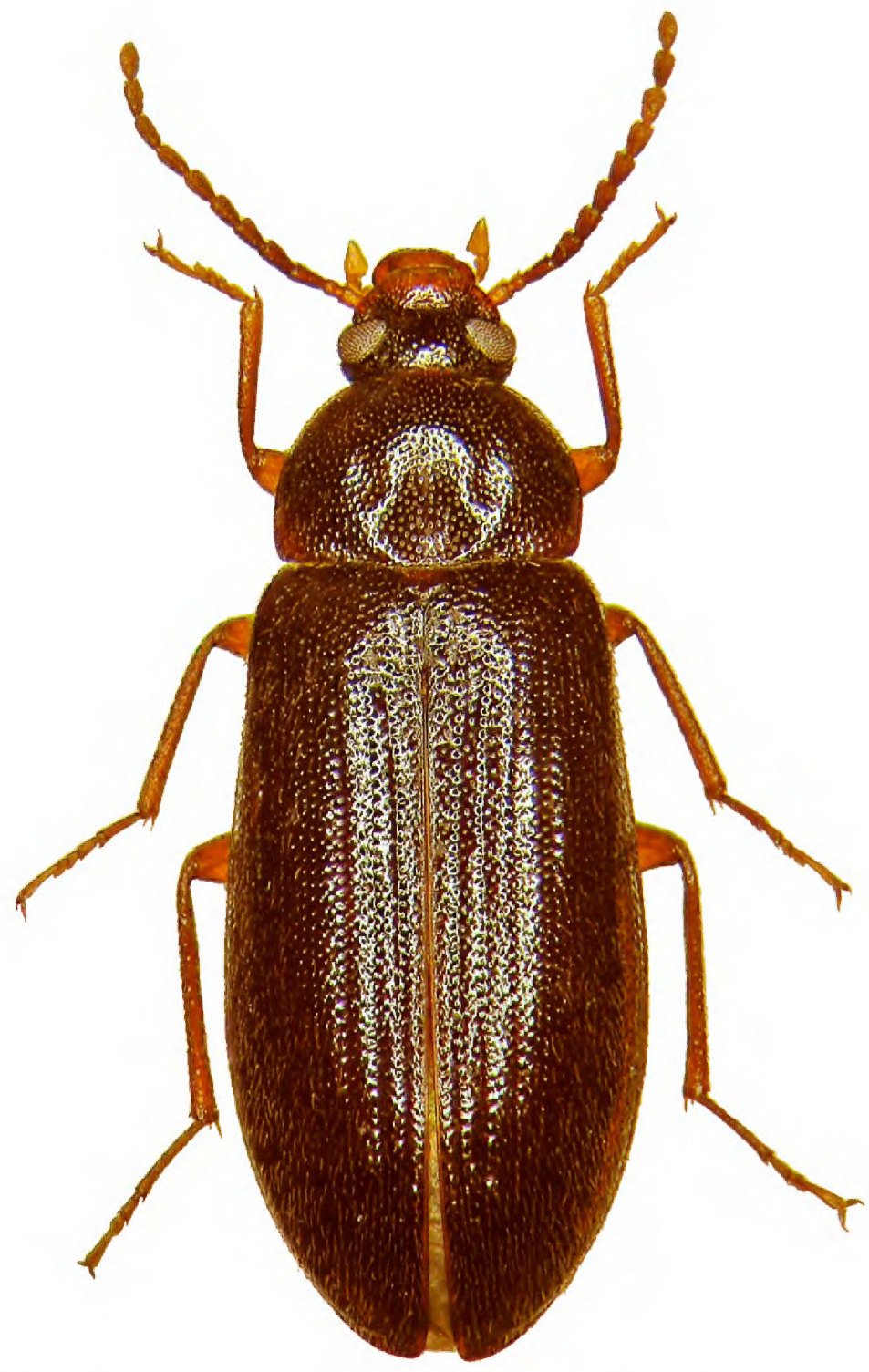

Figure 2. Habitus, *Hymenophorus candeli* (Pardo Alcaide, 1978) (L=7.5 mm). Photos: Fabien Soldati.

Hymenophorus candeli (Pardo Alcaide, 1978)* [E]
(Figure 2)

Examined material: Talassemtane, fir grove, 31.VII. 2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 30.VII.2014, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 04.VIII.2014, Polytrap traps, 2 specimens. Yousra Benyahia *leg*.

Distribution: Very rare species, strictly endemic of central Rif mountain range in Morocco, which was yet known only of one single type female collected in July 1963, in the cedar grove of Tizi Ifri, around 1,700 m. (Pardo-Alcaide 1978). These new collected specimens represent the rediscovery of this species and confirm its occurrence in the cedar and fir groves of Rif mountain range.

Isomira hispanica (Kiesenwetter, 1870)

Examined material: Talassemtane, fir grove, 15.VI.2014, Polytrap traps and colored traps, 11 specimens, Yousra Benyahia *leg*. *Idem*, 19.VI.2014, Polytrap traps and colored traps, 2 specimens, Yousra Benyahia *leg*. *Idem*, 30.VI.2014, Polytrap traps, 3 specimens Yousra Benyahia *leg*.

Distribution: Iberian peninsula, Morocco and Algeria (Novak and Pettersson 2008); France, abundant in the Eastern Pyrenees (Soldati and Bouyon 2011); Larache, the Maamora Forest and Middle Atlas reported with doubt by Kocher (1956).

Subfamily Diaperinae

Corticeus pini (Panzer, 1799)*

Examined material: Talassemtane, fir grove, 04.V.2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 15.VII.2014, Polytrap traps, 1 specimen, Yousra Benyahia *leg*.

Distribution: Euro-Siberian, Canary Islands and Tunisia (Löbl et al. 2008). Also in Morocco, cited only from Rabat (Kocher 1958); first record for Rif mountain range.

Crypticus gibbulus (Quensel, 1806)

Examined material: Bab Taza, oak grove, 20.VI.2014, 5 specimens under stones, Fabien Soldati and Hervé Brustel *leg*.

Distribution: Major part of the Mediterranean basin (Löbl et al. 2008) and largely widespread in Morocco (Kocher 1958).

Diaperis boleti ssp. ***bipustulata*** Laporte & Brullé, 1831*

Examined material: Talassemtane, fir grove, 10.IV. 2013, 1 specimen under bark, Lionel Valladares *leg*. *Idem*, 15.VIII.2014, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 30.IX.2014, 4 specimens, Noureddin Maatouf *leg*.

Distribution: Mentioned from the surroundings of Tangier and the Northern Middle Atlas by Kocher (1958) also from Talassemtane in the Rif mountain range (Kocher 1964).

Figure 3. Habitus, *Pentaphyllus chrysomeloides* (Rossi, 1792) (L=3 mm). Photo: Fabien Soldati.

Pentaphyllus chrysomeloides (Rossi, 1792)* (Figure 3)

Examined material: Talassemtane, fir grove, 30.IX. 2014, 3 specimens, Noureddin Maatouf *leg*.

Distribution: Most of Europe, the Middle East, Central Asia; in North Africa, only known of Tunisia (Löbl et al. 2008). New record for Morocco.

Subfamily Lagriinae

Cossyphus hoffmannseggii (Herbst, 1797)

Examined material: Bab Taza, oak-fir grove, 20.VI. 2014, 3 specimens, Fabien Soldati *leg*. Talassemtane, fir grove, 09.IV.2013, 7 specimens, Hervé Brustel and Lionel Valladares *leg*. *Idem*, 20.VI.2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 20.VI.2014, 13 specimens under large stones in the mud, Fabien Soldati *leg*.

Distribution: Betico-Riffian species: Spain, Portugal, Morocco and Algeria (Löbl et al. 2008); North and central Morocco, from Tangier to the buttresses of the High Atlas (Kocher 1958).

Lagria hirta (Linnaeus, 1758)

Examined material: Talassemtane, fir grove, 15.V.2014, Polytrap traps, 1 specimen, Yousra Benyahia *leg*.

Distribution: Western Palearctic area; cited by Kocher (1956) from various scattered localities of Morocco.

Lagria (Apteronympha) rugosula (Rosenhauer, 1856)

Examined material: Talassemtane, fir grove, 20.VI.

2014, 3 specimens with the sifting of *Bupleurum spinosum*, Hervé Brustel, Lionel Valladares and Olivier Courtin *leg*.

Distribution: Southwest Europe and Morocco; apparently very rare in Morocco and only recorded from Ifrane, in the Middle Atlas by Kocher (1956); first mention for Rif mountain range.

Lagria theryi (Pic, 1938) [E]

Examined material: Talassemtane, fir grove, 04.VI.2014, 1 specimen, Noureddin Maatouf *leg*. *Idem*, 19.VI.2014, colored traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 20.VI.2014, 11 specimens by beating the bushes of *Berberis hispanica*, Hervé Brustel, Fabien Soldati and Olivier Courtin *leg*.

Distribution: Endemic to Morocco (Merkl 2008), where it was only cited from Middle and High Atlas (Kocher 1956); first mention for Rif mountain range.

Subfamily Opatrinae

Dendarus insidiosus ssp. ***riffensis*** (Escalera, 1944) [E]

Examined material: Bab Taza, oak-fir grove, 20.VI.2014, 2 specimens under stones, Fabien Soldati and Olivier Courtin *leg*. Tazaout, fir grove, 10.IV.2013, 1 specimen, Hervé Brustel *leg*.

Distribution: Endemic to Morocco, where it only occurs in the Western Rif (Kocher 1958).

Dendarus pectoralis (Mulsant & Rey, 1854)

Examined material: Bab Taza, oak-fir grove, 20.VI. 2014, 1 specimen under a stone, Fabien Soldati *leg*. Talassemtane, fir grove, 21.VI.2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg*.

Distribution: A Betico-Riffian species, quoted from the Northern Rif mountain range of Morocco and the surroundings of Tangier (Kocher 1958).

Gonocephalum granulatum (Fabricius, 1792) [E]

Examined material: Bab Taza, oak grove, 20.VI.2014, 13 specimens, Fabien Soldati *leg*. Talassemtane, fir grove, 19.VI.2014, 2 specimens, Olivier Courtin *leg*.

Distribution: Endemic to Morocco (Iwan et al. 2010).

Heliopates rectangularis (Antoine, 1951) [E]

Examined material: Talassemtane, fir grove, 20.VI. 2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 19-20.VI.2014, 11 specimens under stones, Fabien Soldati, Noureddin Maatouf, Olivier Courtin and Yousra Benyahia *leg*.

Distribution: Endemic to Morocco, where it only occurs in the Western Rif mountain range (Kocher 1958).

Opatrum (Colpophorus) rifense (Kocher, 1945) [E]

Examined material: Talassemtane, fir grove, 20.VI. 2014, 35 specimens under stones, Fabien Soldati, Noureddin Maatouf, Olivier Courtin, Yousra Benyahia and Hervé Brustel *leg*. Tazaout, fir grove, 10.IV.2013, 2 specimens, Lionel Valladares *leg*.

Distribution: Endemic to Morocco, where it only occurs in the Rif mountain range (Kocher 1958).

Subfamily Phrenapatinae

Clamoris crenatus (Mulsant, 1854)* (Figure 4)

Examined material: Talassemtane, fir grove, 31.VII.2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 15.VIII.2013, Polytrap traps, 8 specimens, Yousra Benyahia *leg*. *Idem*, 15.VIII.2014, Polytrap traps, 2 specimens, Yousra Benyahia *leg*. *Idem*, 30.VIII.2014, Polytrap traps, 1 specimen, Yousra Benyahia *leg*.

Distribution: Iberian Peninsula, France, Italy, Malta, Algeria and Tunisia (Löbl et al. 2008); Corsica (Dodelin 2012). Very rare apart from the Landes area in France. New record for Morocco.

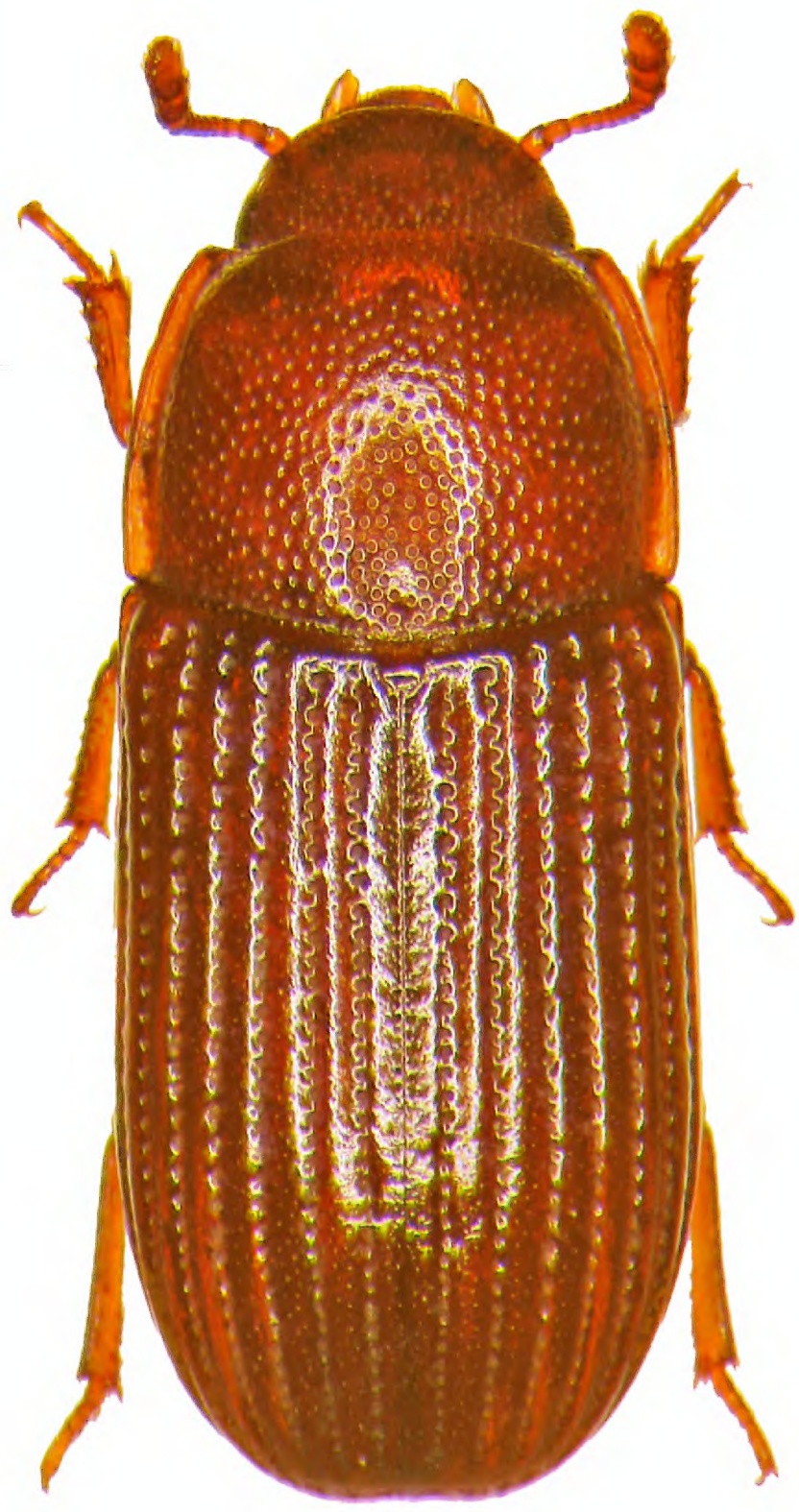

Figure 4. Habitus, *Clamoris crenatus* (Mulsant, 1854) (L=3.5 mm). Photo: Fabien Soldati.

Subfamily Pimeliinae

Alphasida (Machlasida) kraatzi ssp. ***parallelissima*** (Escalera, 1927) [E]

Examined material: Bab Taza, oak grove-fir grove, 20.VI.2014, 1 specimen, Olivier Courtin *leg*.

Distribution: Endemic in Morocco, where it only occurs in the Rif mountain range, especially near Chefchaouen (Pérez Vera and Avila 2012).

Asida (Planasida) septemsis (Pérez Vera, Ruiz & Avila, 2012) [E] (Figure 5)

Examined material: Talassemtane, fir grove, 05.VI. 2014, 1 specimen, Noureddin Maatouf *leg*.

Distribution: Species very recently described on only two specimens of Beni Msuar, to the SE of Tangier (Pérez Vera et al. 2012), new record for the Rif mountain range.

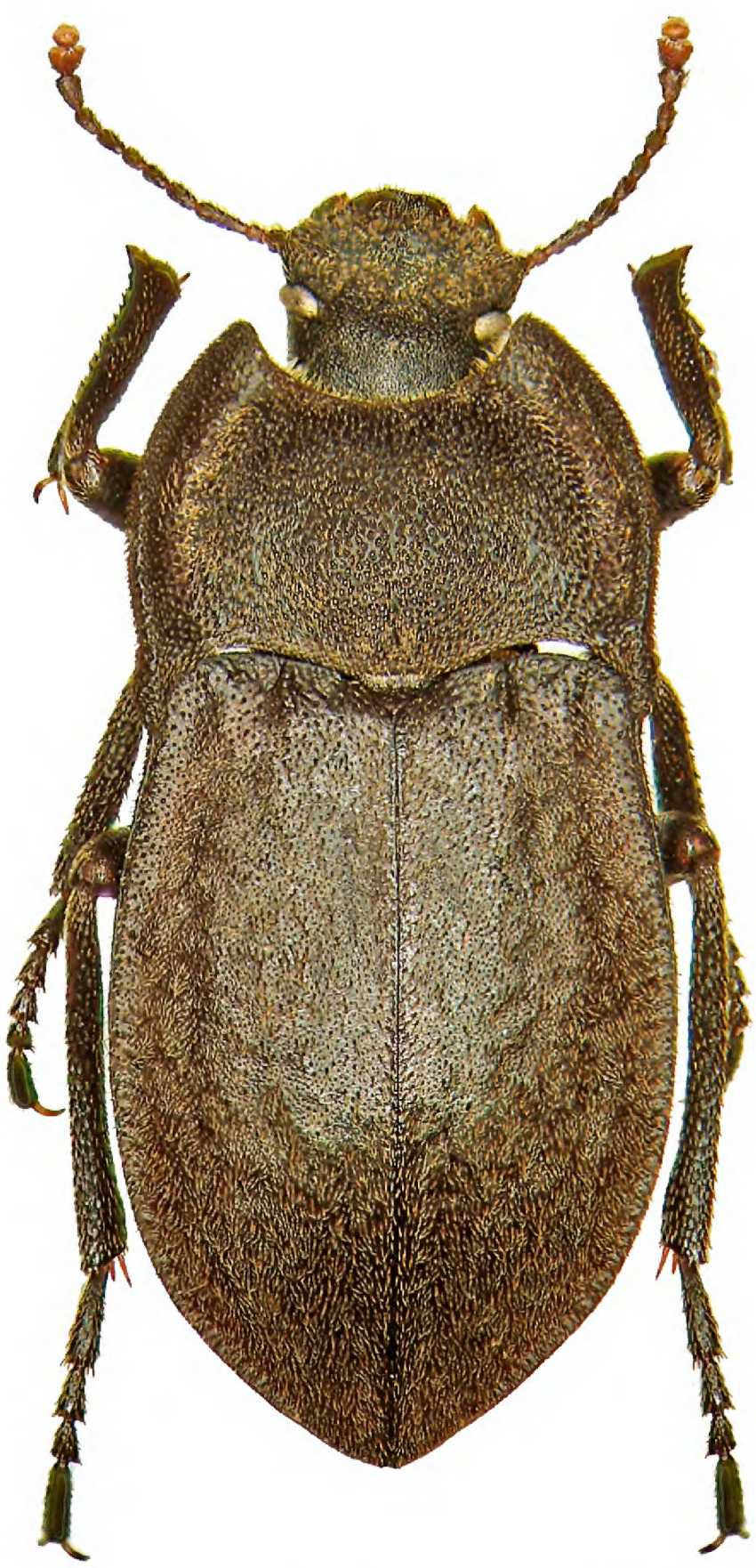

Figure 5. Habitus, *Asida (Planasida) septemsis* (Pérez Vera, Ruiz & Avila, 2012) (L=12.5 mm). Photo: Fabien Soldati.

Dichillus subcostatus (Solier, 1838)

Examined material: Talassemtane, fir grove, 20.VI.2014, in droves under the stones, in litter, 31 specimens, Fabien Soldati, Hervé Brustel, Lionel Valladares, Noureddin Maatouf and Olivier Courtin *leg*. *Idem*, 19.VIII.2014, colored traps, 1 specimen, Yousra Benyahia *leg*.

Distribution: Betico-Riffian species, in Morocco only in the Tangier's area and in the Rif mountain range (Kocher 1958).

Morica planata (Fabricius, 1801)

Examined material: Bab Taza, oak grove, 20.VI.2014, 8 specimens under large stones, Fabien Soldati and Olivier Courtin *leg*.

Distribution: Ibero-Mauritanian species, largely abundant and widespread in Morocco from Tangier to the middle Moulouya, the High Atlas and Souss (Kocher 1958).

Pachychila forticornis (Escalera, 1923) [E]

Examined material: Talassemtane, fir grove, 05.VI. 2014, 2 specimens, Noureddin Maatouf *leg*. *Idem*, 20.VI.2014, 3 specimens under stones, Fabien Soldati *leg*.

Distribution: Endemic to Morocco, where it only occurs in the Rif mountain range (Löbl et al. 2008).

Pachychila salzmanni ssp. ***jordanai*** (Escalera, 1925) [E]

Examined material: Bab Taza, oak grove, 20.VI.2014, 1 specimen under a stone, Fabien Soldati *leg*.

Distribution: Endemic to Morocco, where it only occurs in the Rif mountain range (Löbl et al. 2008).

Pimelia atlantis Solier, 1836 [E]

Examined material: Talassemtane, fir grove, 05.VI.2014, 2 specimens, Noureddin Maatouf *leg*. *Idem*, 20.VI.2014, 2 specimens under stones, Fabien Soldati and Olivier Courtin *leg*. Tazaout, fir grove, 10.IV.2013, 2 specimens, Hervé Brustel and Lionel Valladares *leg*.

Distribution: Endemic to Morocco, where it only occurs in the Rif mountain range and the Middle-Atlas (Kocher 1958).

Stenosis lafanecherei (Antoine, 1951) [E]

Examined material: Bab Taza, oak-fir grove, 20.VI.2014, 4 specimens under stones, Fabien Soldati and Olivier Courtin *leg*. Talassemtane, fir grove, 24.V.2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 04.VI.2013, pitfall trap, 1 specimen, Yousra Benyahia *leg*. *Idem*, 19–20.VI.2014, 8 specimens under stones, Fabien Soldati, Noureddin Maatouf and Hervé Brustel *leg*.

Distribution: Endemic to Morocco, where it only occurs in the Rif mountain range (Löbl et al. 2008).

Stenosis parvicollis (Desbrochers, 1881)

Examined material: Bab Taza, oak grove, 20.VI.2014, 1

specimen under a stone, Fabien Soldati *leg*.

Distribution: Algeria and Morocco (Löbl et al. 2008); cited of the Mediterranean zone of Morocco, Oujda and Tetouan (Kocher 1958).

Subfamily Stenochiinae

Menephilus cylindricus ssp. ***maroccanus*** (Théry, 1931)*

Examined material: Talassemtane, fir grove, 09.IV.2013, 10 specimens, Hervé Brustel and Lionel Valladares *leg*. *Idem*, 31.VII.2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 15.VIII.2013, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 04.VI.2014, 2 specimens, Noureddin Maatouf *leg*. *Idem*, 19-20.VI.2014, 9 specimens under dead barks of *Abies maroccana*, Fabien Soldati, Lionel Valladares, Noureddin Maatouf and Olivier Courtin *leg*. *Idem*, 15.VIII.2014, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. Tazaout, fir grove, 10.IV.2013, 5 specimens, Hervé Brustel and Lionel Valladares *leg*.

Distribution: Algeria and Morocco (Löbl et al. 2008). In this last country, reported of the Middle-Atlas (Kocher 1958) and the Rif mountain range, in particular of Talassemtane (Kocher 1964).

Misolampus goudotii (Guérin-Méneville, 1834)* [E]

Examined material: Bab Taza, oak grove, 19.VI.2014, 2 specimens, Olivier Courtin *leg*. Talassemtane, fir grove, 10.IV.2013, 7 specimens under bark, Lionel Valladares *leg*. *Idem*, 31.VIII.2013, 1 specimen, Yousra Benyahia *leg*. *Idem*, 31.X.2013, 1 specimen, Yousra Benyahia *leg*. *Idem*, 04.VI.2014, 2 specimens, Noureddin Maatouf *leg*. *Idem*, 19.VI.2014, 4 specimens, Olivier Courtin *leg*.

Distribution: Endemic to Morocco (Löbl et al. 2008), where it only occurs in the Tangier's area and the Rif mountain range (Kocher 1958).

Subfamily Tenebrioninae

Helops insignis ssp. ***maroccanus*** (Fairmaire, 1873)* [E]

Examined material: Talassemtane, fir grove, 20.VI. 2014, 9 specimens, Noureddin Maatouf and Olivier Courtin *leg*.

Distribution: Endemic to Morocco (Nabozhenko and Löbl 2008); Tangier's area, Rif mountain range and Middle-Atlas (Kocher 1958).

Nalassus (Helopocerodes) marteni (Español, 1953)* [E]

Examined material: Talassemtane, fir grove, 19.VII.2013, Polytrap traps, 2 specimens, Yousra Benyahia *leg*. *Idem*, 15.V.2014, Polytrap traps, 1 specimen, Yousra Benyahia *leg*. *Idem*, 19.VI.2014, 1 specimen under bark, Hervé Brustel *leg*. Tazaout, fir grove, 10.IV.2013, 3 specimens on fir trees, Hervé Brustel and Lionel Valladares *leg*.

Distribution: Endemic to Morocco (Nabozhenko and Löbl 2008), and micro-endemic of the Western Rif mountain range (Kocher 1958).

Palorus depressus (Fabricius, 1790)*

Examined material: Talassemtane, oak grove, 19.VI. 2014, 1 specimen, Olivier Courtin *leg*.

Distribution: Palearctic area; in North Africa, not cited from Morocco and only recorded from Egypt by Löbl et al. (2008), a doubtful record for an oak forests species. Moreover, it is not recorded from Egypt in the very complete catalogue of Alfieri (1976). In Morocco, it was cited by Kocher (1958) of the forest of Zaër, in the south of Rabat and Casablanca; first mention for Rif mountain range.

Probaticus (Pelorinus) anthracinus (Germar, 1813)*

Examined material: Tazaout, fir grove, 10.IV.2013, 1 specimen, Hervé Brustel *leg*.

Distribution: France, Spain, Portugal, Morocco and Algeria (Nabozhenko and Löbl 2008); Morocco: northern part of the country, between Tangier, the area in the south of Rabat and the Middle-Atlas (Kocher 1958).

Uloma rufa (Piller & Mitterpacher, 1783)*

Examined material: Tazaout, fir grove, 10.IV.2013, 3 specimens, Hervé Brustel and Lionel Valladares *leg*.

Distribution: Europe and Siberia (Löbl 2008); not reported from Morocco by Löbl (2008), but quoted to Tangier's area, until Larache and in the Middle Atlas (Kocher 1958) and Talassemtane, in the Rif mountain range (Kocher 1964).

DISCUSSION

Tenebrionidae constitute one of the families with the highest rate of endemism in Morocco (Chavanon 2003) and, as previously indicated, one of most diversified. Kocher (1958) mentioned already that Tenebrionidae (without Alleculinae and Lagriinae) alone constituted approximately the seventh of all Coleoptera fauna of Morocco. In Europe, only Spain can show a comparable diversity and a rate of endemism about the 60% (Soldati 2007).

Two species has been recorded for the first time in Morocco (*Pentaphyllus chrysomeloides* and *Clamoris crenatus*). Seven species are newly recorded for the Rif's area and especially for the Chefchaouen district (*Asida septemsis*, *Corticeus pini*, *Heliotaurus maroccanus*, *Isomira hispanica*, *Lagria rugosula*, *L. theryi* and *Palorus depressus*). Moreover, the validity of a very rare species (*Hymenophorus candeli*), initially known of a single specimen, is confirmed by the discovery of several specimens of the two sexes, and its membership of the saproxylic community characterizing the cedar and fir groves of Rif was evidenced.

This work highlights the exceptional heritage value of the Talassemtane National Park (PNTLS) and more particularly the forests of *Abies maroccana Trab.* The protection of this valuable climax forest is reinforced by the specific richness of 35 species recorded for Tenebrionidae (Coleoptera) and 9 darkling beetles endemic of Rif. These remarkable biodiversity will be able to be maintained only with specific conservative measures adapted to the maintenance of the pastoralism and the forest.

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